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It may not be amiss to mention here, that this Pump, which was used at the said New Canal, was eight foot and a half long, and one foot eight inches broad at the top, and about eight inches broad at the bottom where it is inserted in the Box, and did cast out eight Gallons at a stroke, and twenty one strokes being made in one minute, there was delivered about 169 Gallons in a minutes time; whence 'tis easie to compute, what quantity is thrown out in an hour.

If it be asked, why the Pump and the Bucket is not of the same breadth throughout as high as the Bucket moveth? I answer, that it cannot be allowed of any other fashion than a tapering one, because that the celerity of the motion in the narrowest part of the Pump would thereby be obstructed in its supplying the delivery of the Water, which is thereby provided for the evacuation answering to the bigness of the uppermost broader part of the Pump.

Note, that this kind of Pump may by the same contrivance be made of a Tree bored through with a Taper-bore; and a Basket may be used at the bottom of the Pump instead of the Box-Colender.

Some Considerations of an observing person in the Country upon Numb. 133. of these Tracts, sent in a Letter to the Publisher of May 2, 1677.

SIR,

YOur Tract of Numb. 133. is very pleasing for the great variety of good Arguments, some very curious, some very useful, all very considerable.

1. Your Preface is brief and modest. And never were noble Travellers better furnish'd with learned and accurate Instructions, and with exact and compleat Exemplars, as appears in several of your Breviates. In the first Volume you suggest some of the most remarkable *Inquiries* for many foreign Countries: You begin with Artificial Instruments, N. 1. p. 31; more parti-cu'larly for the Sea, N. 8. p. 148, further explain'd N. 24; and with an Instrument for drawing any Object in perspective, N. 45. And now Mr. *Moxxon*, Mr. *Seller*, Mr. *Green*, Mr. *Morden* and others are abundantly furnished with Sea-plots for all Navigations, Projections, Mathematical Books and Mathematical Instruments for all occasions of Travellers by Sea or Land. Neither *Anacharsis*, nor *Democritus*, *Pythagoras*, nor *Apollonius*

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Thyancus, could boast of such furniture for their Philosophical peregrinations. And, besides the Learned *Greshamists*, you have many expert Teachers of these useful Arts. And a Free School is lately erected by his Majesties munificence, to instruct forty young Scholars in Geometry, Navigation, and other parts of the Mathematicks. Mean while our Universities and noble Palaces are, some of them, provided of Furnaces and Chymical Expedients; some for Astronomical Observatories, some for Conservatories: To draw still more Philosophy from them all.

2. The Agrestic Advertisements may mind some Gardiners, and Nursery-men, and Country-gentlemen, to do much good for themselves and for their Country: And may mind Worthy Merchants, to bring us home the best Vegetables for Food, Drink, Medicine, or other good uses; and may excite a more general industry, to silence all just complaints of the want of good employment in *England*.

3. Mr. *Leewenhoecks* Microscopical Discoveries are exceeding curious, and may prompt us to suspect, that our Air is also verniculated *, and perhaps most of all in long Calms, long-lasting Eastern Winds, or much moisture in Spring-time, and in seasons of general Infections of Men or Animals. Lord *Bacon*

* But this Observer could hitherto never find this, as he intimates in the sequel of that Discourse, which perhaps may be published hereafter.

in his *Nat. History* makes a Collection of Prognosticks of Infectious years, such as could be made without such curious Instruments. By which perhaps in time we may be premonished of Infections. And if we may be certain of seasons of great danger, I think we may be certain of effectual Remedies, by Gods blessing: As we find by Experience, that *Fires* and *Smotheres* duly order'd, so as that the Winds may drive and carry them all over our Orchards and Gardens, do infallibly destroy all Caterpillars and other noxious Insects: And to interrupt the Calms and other annoyances of the Air, we may apply all the helps recommended in *Muffet's Improvement of Health*, c. 4. viz. by noise of Bells, Guns, Drums, Trumpets, Tabrets and other Musical Instruments; by the cheerful shouts of the people, and by cleansing all our Towns and Villages by Fire and pure Water, which will be more effectual, if it be done every where at the same set time, as when the Festival Bonfires were in use all over the Kingdom.

4. Signor *Cassini*'s account of the Satellites of *Saturn* are very remarkable. We hear of no expedients to view the back-parts of *our Moon*; but possibly by future improvements of Telescopes we may make some guess of the back parts of some of the Moons of *Saturn* or *Jupiter*, as Monsieur *Bullialdus* hath found blind sides of the Starry Firmament, as we call it.

5. 'Tis well for us, that Mr. *Ray* is an indefatigable person. For, this his latter Task requires a mans age to perform it so exactly as he hath done: Besides his other great labours, and what we expect from his help for the *History of Animals*.

6. *Aero-chalinos* was very necessary after so many wonderful discoveries of *Air* in general. Much rich Oar is already digg'd out of the Heart and from the bottom of Rocks and Mountains; but we want many hands to melt it down, and to form it into Utensils. These subtle Fluids do encompass us in vast proportions, and do besiege us both with strong and stormy violence, and with treacherous and irresistible Insinuations. May the happy Author persevere, and prosper in compleating the large branch of most subtle and no less useful philosophy.

7. I do not remember, I ever saw any thing that might be compared with this last philosophical Account of *Musick*; nor indeed any thing before, that could satisfie my own poor and dull scruples. And many of these Observations do seem to me to open a door for great depths, and great variety of Philosophical information. I was not a little delighted to read in Mr. *Boyle's* Tract of *Mens ignorance of the Usefulness of Natural Things*, in his Second Tome of the Usefulness of that Philosophy, p. 14, That *equal wire-strings, made of differing mettals, and having a due Tension, will yield sounds differing as to sharpness, by determinate Musical Notes or the Divisions of them, &c.* I do not know, whether this Author, *Mersennus*, or any other, hath examined, How far the proportions of Metalline mixtures, or the nature of other sonorous bodies, may be indicated by this Musical Expedient. Many such hints and overtures may be had in this acute, or rather harmonious discourse.